

ON THE NON-MARINE MOLLUSCA FROM THE  
HOLOCENE DEPOSITS AT LONDON WALL AND WESTMINSTER.

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1. LONDON WALL.

DURING the year 1901 extensive excavations were made in Finsbury Circus and London Wall for the foundations of buildings for the London Wall Estate Company. Facilities were afforded us to visit and examine the sections, and we have secured numerous objects of interest. As is so often the case with Holocene deposits, the sections varied greatly, but there were always three well-marked layers. The lowest bed was Pleistocene gravel, 4 to 5 feet thick, resting on the London Clay. This was succeeded by an alluvial deposit of peaty clay from 4 to 8 feet thick, containing the remains of mollusca, as well as numerous objects belonging to the Roman period, such as broken bones, fragments of Samian ware and other pottery, besides large quantities of *Ostrea edulis*, Linn., *Mytilus edulis*, Linn., and *Cardium edule*, Linn.; whilst a few examples of *Littorina littorea* (Linn.), *Buccinum undatum*, Linn., and *Macoma baltica* (Linn.) also occurred. The uppermost bed was 'made earth,' consisting of the débris of the city: it included large quantities of old leather, mediæval pottery, broken greybeards, etc., and was, in fact, a great dustbin accumulation. On the north-eastern side of the excavation, the lower part of the alluvial layer was evidently deposited by a large stream, in all probability the Wallbrook. Numerous traces of 'pile dwellings' were disinterred in this spot. The non-marine mollusca were all obtained from the alluvial layer, of which the major part was accumulated during the Roman period, whilst the upper portion was deposited between the close of that period and Norman times. All the species occurred in the Roman layer; the later deposits, though yielding more examples, contained far fewer species. *Helix aspersa* occurred at the base, whilst one example of *Vitrea cellaria* was found still attached to part of a 'pile dwelling.'

The species of mollusca obtained were :—

<i>Agriolimax agrestis</i> (Linn.).	<i>Planorbis albus</i> , Müll.
<i>Vitrea cellaria</i> (Müll.).	„ <i>glaber</i> , Jeff.
„ <i>nitida</i> (Müll.).	„ <i>nautilus</i> (Linn.).
<i>Hygromia hispida</i> (Linn.).	„ <i>marginatus</i> , Drap.
<i>Vallonia pulchella</i> (Müll.).	„ <i>vortex</i> (Linn.).
<i>Helix aspersa</i> , Müll.	„ <i>spirorbis</i> , Müll.
„ <i>nemoralis</i> , Linn.	„ <i>contortus</i> (Linn.).
<i>Cochlicopa lubrica</i> (Müll.).	„ <i>fontanus</i> (Lightf.).
<i>Succinea elegans</i> , Risso.	<i>Bithynia tentaculata</i> (Linn.).
<i>Carychium minimum</i> , Müll.	„ <i>Leachii</i> (Shepp.).
<i>Velletia lacustris</i> (Linn.).	<i>Valvata piscinalis</i> (Müll.).
<i>Limnæa peregræ</i> (Müll.).	„ <i>cristata</i> , Müll.
„ <i>palustris</i> (Müll.).	<i>Sphærium corneum</i> , Linn.
„ <i>stagnalis</i> (Linn.).	„ <i>lacustre</i> , Müll.
<i>Physa fontinalis</i> (Linn.).	<i>Pisidium pusillum</i> , Gmel.
„ <i>hypnorum</i> (Linn.).	„ <i>nitidum</i> , Jenyns.
<i>Planorbis corneus</i> (Linn.).	„ <i>milium</i> , Held.

Of these the most noteworthy are *Planorbis glaber*, *P. fontanus*, and *Sphærium lacustre*.

*Planorbis glaber* is extremely rare in Holocene beds, being known only from Westminster, Raine, Barry Docks, and from alluvial deposits near Edinburgh. It was not an abundant form at London Wall, but was far more prevalent than *P. albus*.

*P. fontanus* is another rare form in Holocene beds, but it has been found at Raine, Crossness, Charlton, the Lea Valley, Westminster, and the Hampshire tufaceous beds.

*Sphærium lacustre* has hitherto been represented in a fossil state solely by specimens in the York Museum, said to come from the Pleistocene of Barnwell. It is a widely distributed form in these Islands at the present day, and is certainly not a modern introduction; but since its habitat is usually muddy ponds or ditches, it is unlikely to be found in the stream deposits which form the vast majority of our fossiliferous Pleistocene and Holocene beds.

In 1890 eleven species of shells were described<sup>1</sup> from a similar deposit at Moorfields, and the large size to which many of the examples attained was remarked upon. The examples from London Wall are equally noteworthy. *Succinea elegans* attains a length of 18 mm., *Physa hypnorum* 14 mm., and *Limnæa palustris* 22 mm., whilst *Planorbis corneus* attains a breadth of 25·5 mm., *P. marginatus* 16 mm., *P. vortex* 8 mm., and *P. fontanus* 7·5 mm. *Helix aspersa* is not uncommon, and occurs throughout the Roman layer.

<sup>1</sup> B. B. Woodward, "On the Pleistocene (non-Marine) Mollusca of the London District": Proc. Geol. Assoc., vol. xi, p. 339.

## 2. WESTMINSTER.

Shells have also been obtained lately from the excavations made in Whitehall for the foundations of the new War Office. They occurred in a bed of peaty loam at a depth of some 15 feet from the surface, and are probably of the same age as those described by one of us in 1890.<sup>1</sup> It is well known that the immediate vicinity of Westminster Abbey was in historic times an island called Thorney, and there can be no doubt that this bed was deposited by one of the boundary streams. From the absence of relics of human occupation, it may be Roman or pre-Roman.

The species of mollusca obtained are twenty-two in number, viz. :—

<i>Pyramidula rotundata</i> (Müll.).	<i>Planorbis corneus</i> (Linn.).
<i>Hygromia hispida</i> (Linn.).	„ <i>albus</i> , Müll.
<i>Helix nemoralis</i> , Linn.	„ <i>marginatus</i> , Drap.
<i>Fallonia pulchella</i> (Müll.).	„ <i>contortus</i> (Linn.).
<i>Vertigo antivertigo</i> (Drap.).	<i>Bithynia tentaculata</i> (Linn.).
<i>Succinea elegans</i> , Risso.	<i>Valvata piscinalis</i> (Müll.).
<i>Carychium minimum</i> , Müll.	„ <i>cristata</i> , Müll.
<i>Limnæa auricularia</i> (Linn.).	<i>Neritina fluviatilis</i> (Linn.).
„ <i>pereger</i> (Müll.).	<i>Anodonta cygnæa</i> (Linn.).
„ <i>palustris</i> (Müll.).	<i>Sphærium corneum</i> (Linn.).
„ <i>truncatula</i> (Müll.).	<i>Pisidium amnicum</i> (Müll.).

These are all common forms in Holocene beds, and call for no extended notice.

<sup>1</sup> Loc. cit., p. 341.